

REMARKS

In the present amendment, claims 18-28 have been amended and claim 23 has been canceled. Accordingly, claims 16-22 and 24-28 are pending in the application with claim 18 being independent. Of the pending claims, claims 18-22 and 24-28 are under consideration and claims 16 and 17 have been withdrawn from consideration.

Applicants note that claim 18 has been amended to recite “the nickel-zinc alloy having 60 to 80 wt% of Ni and 20 to 40wt% of Zn.” Support for the amendments can be found in the present specification at paragraph [0029] (published application).

Applicants note that further amendments to claims 18-28 have been made to further clarify language as indicated by the indefiniteness rejections.

No new matter has been added.

Rejection under 35 U.S.C. § 112, second paragraph

The Office Action rejects claims 18-28 under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite. With respect to independent claim 18, the Office Action states that it “is not entirely clear as to whether the resin layer forming the insulating layer of lines 1-2 is the same as the resin layer of lines 9-14. The Office Action further asserts that claims 27 and 28 are indefinite, arguing that “merely reciting a use without active, positive steps delimiting how this use is actually practiced” renders a claim indefinite.

In response, Applicants note that claims 18-28 have been amended to even further clarify the language of the claims. Accordingly, withdrawal of the indefiniteness rejections is respectfully requested.

Rejection under 35 U.S.C. § 101

The Office Action rejects claims 27 and 28 under 35 U.S.C. § 101 for the same reason as pointed out in the indefiniteness rejection, i.e., that “the claimed recitation of a use, without setting forth any steps involved in the process,” is improper.

As noted above, claims 27 and 28 have been amended to even further clarify the language, wherefore withdrawal of the rejection under 35 U.S.C. § 101 is respectfully requested as well.

Rejection under 35 U.S.C. § 103(a)

The Office Action rejects claims 18-28 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Suzuki et al. (US 2004/0038049), hereinafter “Suzuki,” in view of Matsushima et al. (US 6,905,757), hereinafter “Matsushima.” The Office Action contends that Suzuki teaches all elements of the presently claimed invention, except that “the resin as claimed is not specifically taught.” The Office Action relies on Matsushima for teaching “a resin composition having the claimed composition” and concludes that it would have been obvious to one skilled in the art to combine the teachings of Matsushima and Suzuki.

Applicants respectfully traverse the rejection. Applicants note that in an attempt to advance prosecution of the present application, and without expressing agreement with or acquiescence to the rejection, claim 18 has been amended by reciting that “the nickel-zinc alloy having 60 to 80 wt% of Ni and 20 to 40wt% of Zn.” Applicants note that Suzuki does not teach or suggest the claimed nickel-zinc alloy layer. As also stated by the Office, Suzuki teaches in paragraphs [0076]-[0077] a Ni-layer and a Zn-layer deposited on the copper layer. Concerning

the argument of the Action that diffusion of the zinc layer with the nickel layer may occur, Applicants note that this would not result in the Ni-Zn alloy of the presently claimed invention, i.e., “having 60 to 80 wt% of Ni and 20 to 40wt% of Zn.” Applicants further note that the technical feature of a Nickel-Zinc alloy layer has the advantages of enabling long lasting effects of a) heat resistance, provided by the Zn, and b) chemical resistance, provided by Ni. Applicants also refer to the teachings of the present specification, paragraph [0028] of the published application, which teaches the advantages of a high percentage of Nickel in the rust-proofing Nickel-Zinc alloy layer:

“... it is found that the presence of nickel in the rustproofing layer shows a tendency of remarkable improvement in the adhesion with a constituting resin of the base material. The rustproofing layer formed of the nickel-zinc alloy, with the nickel content of less than 50 wt %, cannot be expected to have an improving effect on the adhesion with various kinds of base materials.”

Furthermore, paragraph [0029] of the present specification teaches:

“The result of studies of the present inventors has confirmed that a more nickel amount has a tendency of improving the adhesion strength, chemical resistance, moisture resistance and solder-blister resistance, and a more zinc amount has a tendency of deteriorating the chemical resistance and solder-blister resistance. Further, it is found that when the total coating amount of nickel and zinc is set to be in the range from 20 mg/m.² to 100 mg/m.² in the case of forming a rustproofing layer of a nickel-zinc alloy, the ratio of the nickel to the zinc (nickel/zinc) is set practically suitably to be in the range from 6/4 to 8/2.”

In contrast to the presently claimed invention, Applicants note that Suzuki, paragraph [0076], teaches an “ultra-thin copper foil A with a carrier,” wherein “it is preferred to further form a nickel layer and a zinc layer on the roughened surface 4a in this order.” Accordingly, in Suzuki the Nickel layer is covered by a Zinc layer, and therefore, Suzuki does not recognize or suggest the above cited advantages of having Nickel in a high percentage present together with Zinc in an alloy layer.

Applicants further point out that Suzuki can be further distinguished from the claimed invention for the reason that Suzuki requires a roughening treatment, which would not necessarily result in a surface roughness “of less than 2 μm ,” as employed by the presently claimed invention. Concerning the assertion of the Office Action that Suzuki, paragraph [0075], discloses “the range of 0.2-2 microns which overlap the claimed range,” Applicants point out that the size of 0.2 to 2 microns taught in Suzuki is not directed to the measured surface roughness, but to the “copper particles having 0.2 to 2.0 μm ... deposited as nodules on the surface of the copper plating layer already formed” (see Suzuki, paragraph [0075]). Applicants note that it is well known in the art that when particles having a diameter of 2 microns are deposited on a plated surface, gathering of said particles may very likely occur, which results in a surface roughness exceeding 2.0 microns. In this regard, Applicants refer to Figures 1 and 2 shown below, to more clearly demonstrate the discussion herein. Applicants note that when roughening treatment is carried out in the manner of providing particles on a plated surface, the ideal state would be a formation as shown in Figures 1a) and 1b). However, in real practice, since the plated surface is bumpy to at least a certain degree, the particles tend to concentrate on the top of the bumps, resulting in a rougher surface profile of the plated surface than before the roughening treatment. Such depositing behavior is commonly known in the technical field. Therefore, one skilled in the art would have known that a roughening treatment with particles in the range of 0.5 to 2.0 microns does not necessarily result in an actual surface roughness R_{z} of less than 2.0 microns as employed by the presently claimed invention.

Figure 1

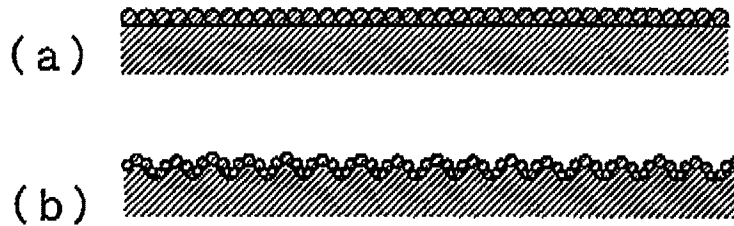


Figure 2



Moreover, Applicants note that a roughening treatment has the disadvantage that a so-called over-etching time in the etching process for forming a wiring is required, because particles deposited during roughening treatment are buried in the resin substrate and therefore should be fully etched out. However, it is well known that over-etching has the disadvantage of providing a poor etching factor in the wiring. As also taught in paragraph [0009] of the published application, Applicants note that in the case that a roughening treatment is not performed, “an over etching time for dissolving roughening-treated parts in circuit etching is not required,” which enables reduction of the total etching costs and that “the etching factor of the obtained circuit may remarkably improved.”

With regard to Matsushima, Applicants note that Matsushima fails to disclose at least the presently claimed “nickel-zinc alloy having 60 to 80 wt% of Ni and 20 to 40wt% of Zn,” as well as “an electrodeposited copper foil layer formed on top of the bonding interface layer having a surface roughness (R_{zjis}) on both sides of less than 2 μm .” Accordingly, the combination of Suzuki and Matsushima does not lead to or suggests the presently claimed invention.

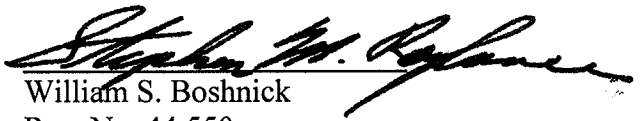
In view of the foregoing and the amendments to the claims, Applicants respectfully request withdrawal of the obviousness rejection over Suzuki in view of Matsushima.

CONCLUSION

In view of the foregoing amendments and remarks, the Examiner is respectfully requested to reconsider the objections rejections of record, and allow each of the pending claims.

If any issues yet remain which can be resolved by telephone, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

Respectfully submitted,
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